

REMARKS

The Office action dated April 7, 2006, and the references cited therein have been received and carefully reviewed.

Claims 1-6 and 10-13 are objected to on formal grounds for containing a grammatical error, which is believed to have been addressed by the above amendment.

Claims 1-4, 6, 10-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art shown in Figures 23-24 (AAPA Figures 23-24) in view of U.S. 6,443,692 to Sakamoto and U.S. 6,336,788 to Fujii. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA Figures 23-24 in view of Sakamoto and Fujii, and further in view of U.S. 6,527,507 to Rollwage. Claims 14-16 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA Figures 23-24 in view of Sakamoto and Fujii, and further in view of U.S. 6,527,507 to Rollwage. Claims 1, 2, 3, 5, 6, 10, 11, and 13 are rejected under the judicially created doctrine of obviousness-type double patenting rejection as being unpatentable over claims 1, 18, 18, 19, 18, 18, and 1, respectively, of U.S. 6,733,230 in view of Fujii and AAPA Figures 23-24. Claim 4 is rejected under the judicially created doctrine of obviousness-type double patenting rejection as being unpatentable over claim 18

of U.S. 6,733,230 in view of Fujii and AAPA Figures 23-24, and further in view of Sakamoto. Claim 12 is rejected under the judicially created doctrine of obviousness-type double patenting rejection as being unpatentable over claim 18 of U.S. 6,733,230 in view of Fujii and AAPA Figures 23-24, and further in view of Rollwage. Claims 14, 15, 17, 21, and 22 are rejected under the judicially created doctrine of obviousness-type double patenting rejection as being unpatentable over claim 18 of U.S. 6,733,230 in view of Fujii and AAPA Figures 23-24, and further in view of Rollwage. Claim 16 is rejected under the judicially created doctrine of obviousness-type double patenting rejection as being unpatentable over claim 19 of U.S. 6,733,230 in view of Fujii, AAPA Figures 23-24, Rollwage, and further in view of Sakamoto.

These references have been carefully reviewed but are not believed to show or suggest Applicants' invention as now claimed. Reconsideration and allowance of the pending claims is therefore respectfully requested in view of the following remarks.

None of the cited references, taken alone or in combination with each other and with AAPA Figures 23-24, teach or suggest the presently claimed invention.

By the above amendment, claim 1 has been amended to

incorporate the limitations of claim 5, which has been canceled. Claim 1 now recites that "the pulsation canceling device is arranged and constructed to displace the first discharge port from the second discharge port by a distance corresponding to half the predetermined pitch of the grooves of the impeller, and the grooves of the impeller defined in the first surface and the grooves of the impeller disposed in the second surface are disposed at the same positions in the circumferential direction of the impeller". Similarly, claim 14 has been amended to recite the limitations of claim 17, which has been canceled. Claim 14 now recites that "the pulsation canceling device is arranged and constructed to displace the first discharge port from the second discharge port by a distance corresponding to half the predetermined pitch of the grooves of the impeller, and the grooves of the impeller defined in the first surface and the grooves of the impeller disposed in the second surface are disposed at the same positions in the circumferential direction of the impeller".

According to the presently claimed invention, the fuel is discharged via the first and second discharge ports (53, 73 in Fig. 6) and the flow of fuel from these discharge ports is then converged at the convergence channel 62.

Sakamoto et al., which was cited as teaching the pulsation canceling device (Office action, page 8), does not teach or suggest discharge ports that are displaced from each other, as recited in the amended claims. Rather, Sakamoto et al. teaches that the grooves of the first surface and the grooves of the second surface of the impeller are displaced from each other. With this arrangement, the flow of the fuel on the side of the grooves of the first surface and the flow of the fuel on the side of the grooves of the second surface immediately converge at a single discharge port 34. Therefore, the pulsation reducing is degraded in comparison with the convergence of the flow from separate discharge ports.

Applicants also wish to point out that the design of the claimed invention enables the use of existing conventional impellers in which the grooves of the first surface and the grooves of the second surface of the impeller are disposed at the same positions.

In view of the above amendments and remarks, it is submitted that claims 1-4, 6, 10-16, and 21-22 are in condition for allowance, and an early notice to that effect is solicited.

If any final points remain that can be clarified by

telephone, Examiner Verdier is respectfully encouraged to
contact Applicants' attorney at the number indicated below.

Respectfully submitted,

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